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ESTIMATE OF NORTH VIETNAM CASUALTIES

D RUMD 1-01

PHOTOGRAPHIC BOMB DAMAGE ASSESSMENT (U)

AP-550-5-1-67-INT

January 1967

WARNING

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DIA review(s) completed.

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(SNF) This publication has been produced because of the interest shown by various Commands and Agencies, various Offices of the Defense Department and National Command Authorities in estimates of military and civilian casualties as a result of air attacks on North Vietnam. Included are tabulations showing estimated cumulative casualties for both JCS and certain non-JCS targets resulting from attacks on these targets from the inception of the U.S. air strike program to 31 December 1966. Also included is a discussion of the methodology used in estimating these casualties. This publication will be updated and republished monthly.

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PART I

INTRODUCTION

1. (C) This publication provides information on the number of military and civilian casualties estimated to have resulted from air attacks on North Vietnam targets. Estimates presented herein have been made by applying casualty experience factors to strike damage determined exclusively from post strike photography.
2. (C) Part II contains the methodology used in making the estimates. Part III is a tabulation of estimated military and civilian casualties resulting from strikes on the respective JCS numbered targets. The targets are identified by name, JCS number, and coordinates. The dates of the photography utilized in analyzing each target are included along with the total strike sorties on the target prior to the time the photography was taken. Part IV is a tabulation of civilian casualties resulting from strikes on selected non-JCS numbered targets. These targets are identified by name, B.E. number, and coordinates. Estimated military casualties are not included, as they are in Part III, since most of these targets are bridges, small railroad yards, and dispersed POL sites wherein the presence of military personnel is unknown. Part V is a tabulation of the total estimated military and civilian casualties reflected in Parts III and IV. Total estimated casualties for certain city complexes encompassing targets listed on Parts II and III are also tabulated in Part V.

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3. (C) All casualty estimates in Parts III and IV are considered applicable for a warned condition. For a primarily unwarned condition it is estimated that casualties would be increased by a factor of ten, and based on this ratio both warned and unwarned totals are included in Part V. Casualty estimates as contained herein include both killed and wounded.
4. (C) It is emphasized that these casualty estimates have been developed only for the targets listed and that the totals are not intended to represent total casualties resulting from U.S. air strikes on North Vietnam. These statistics do not include an estimate of civilian casualties as a result of armed peace except for restrikes of JCS numbered targets as reflected in Part III and armed peace against targets listed in Part IV for which pre and post strike photography is available for interpretation. Also, as the methodology utilized reflects only an estimated average relationship between damage and casualties, casualty estimates cannot be considered precise for any specific target.

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PART III

METHODOLOGY EMPLOYED IN MAKING ESTIMATES

1. (SNF) The following two methods were utilized in estimating casualties depending on whether the target is (a) a JCS numbered target with estimates of population in the immediate vicinity available, or (b) a non JCS numbered target with no specific demographic data available.

a. JCS Numbered Targets: This procedure considers casualties which may have occurred in the target and surrounding area within which, theoretically, all bombs dropped should fall. The total area considered includes the delineated target area plus a spillover area within 3 CEP's (Circular Probable Error) of the target area border. A standard CEP of 200 feet was assumed. Demographers developed estimates of the number of military and civilian personnel within both the delineated target area and the surrounding spillover area. Then, in estimating the probable military and civilian casualties, the number of personnel at risk in each area was multiplied by the ratio of the total average lethal area of bombs impacting to the total area involved. If it was discovered during bomb damage assessment (BDA) that some damage accrued to civilian built-up areas outside of the areas discussed above, the methodology outlined in paragraph 1.b. below was used and these additional civilian casualties were added to the estimates developed by the above procedures.

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b. Non JCS Numbered Targets: For this category no specific demographic information was available and the following procedure was used in estimating civilian casualties. During the EDA process the number of civilian structures destroyed or severely damaged at each target was tabulated. This number of structures was then multiplied by 0.25 to arrive at the estimated number of casualties. This figure of 0.25 casualties per civilian structure destroyed or damaged is based on data contained in the U.S. Strategic Bombing Survey Summary Report, Effects of Air Attack on Japanese Urban Economy, March 1947. Japanese data was chosen instead of German data because Japanese structures are more closely related to those of North Vietnam.

2. (SNF) The above procedures are considered applicable for a warned condition. As noted in Part I, it is estimated that casualties would be increased by a factor of ten should the personnel be completely unwarned. The 10:1 ratio follows from the fact that the lethal areas for unwarned personnel are approximately ten times as great as those for warned personnel. This is based on the following assumptions: (a) 50% of the unwarned personnel are in the open and 50% are in residential buildings; and (b) warned personnel have protection equivalent to that of a fox-hole or trench.

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PART III

ESTIMATES OF CASUALTIES FOR JCS TARGETS (U)

Date:

NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES		NO. OF CONTINENTS	REMARKS
				CIV.	MIL.		
Na San Airfield	1	21-12-46N/104-02-18E	23 Nov 65	0	10	27	
Dien Bien Phu Airfield	2	21-23-40N/103-00-38E	16 Feb 66	1	12	110	
Dong Hoi Airfield	4	17-30-38N/106-35-46E	9 Nov 66	0	6	65	
Vinh Airfield	5	18-44-02N/105-40-32E	30 June 65	5	5	109	
Ninh Binh RR & Hwy Br	10	20-15-40N/105-59-20E	11 Nov 66	4	35	33	
Hoi Duong RR & Hwy Br	11	20-56-33N/106-21-29E	5 Nov 66	1	0	51	
Thanh Hoa RR & Hwy Br	14	19-50-12N/105-47-54E	9 Nov 66	25	0	133	
Viet Tri RR & Hwy Br	15	21-17-55N/105-26-58E	28 June 66	0	0	8	
Dap Cau RR & Hwy Br	16	21-12-15N/106-05-42E	5 Nov 66	1	0	10	
Hai Phuong Hwy Br	17	21-00-12N/106-41-25E	1 May 66	1	0	22	
Dong Hoi Hwy Br	18.1	17-27-21N/106-37-50E	4 Mar 66	1	0	35	
My Duc Hwy Br	18.11	17-13-51N/106-42-24E	8 Mar 66	3	0	13	
Xoa Phuong Hwy Br	18.12	17-32-47N/106-33-04E	6 Sept 66	5	0	33	
Kim Cuong Hwy Br SW	18.13	18-26-00N/105-13-25E	2 Nov 66	6	0	51	
Khe Kien Hwy Br V	18.14	19-16-21N/104-21-35E	9 Apr 65	5	0	8	
Bai Duc Hwy Br	18.15	18-04-05N/105-49-30E	2 May 66	2	0	18	

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES		NO. OF SORTIES	REMARKS
				CIV.	MIL.		
Quang Khe Bay Ferry W	18.16	17-42-42N/106-26-50E	27 May 65	1	0	12	
Minh Bay Ferry	18.17	18-38-40N/105-42-35E	8 June 65	1	0	29	
Min Cuong Bay Br W	18.19	18-26-35N/105-14-30E	4 Sept 65	1	5	4	
Thanh Yen Bay Br	18.2	17-38-11N/106-31-24E	9 Nov 66	6	0	23	
Thu Ty BR Br	18.21	20-32-50N/105-55-15E	8 Oct 66	4	0	31	
o Taii Br & Bay Brs	18.22	20-41-40N/105-54-55E	11 Sept 66	2	0	28	
ac Oia BR & Bay Br	18.23	21-16-28N/106-11-24E	4 July 66	1	0	45	
ai Dong BR & Bay Br E	18.24	21-33-25N/106-29-55E	19 Sept 66	1	0	80	
ang Dun BR Br	18.25	23-58-22N/106-23-29E	29 June 66	0	0	85	
ep Bay Br	18.27	22-09-00N/104-23-23E	27 Sept 66	2	0	79	
ri Dong Bay Br	18.31	21-26-35N/106-17-47E	31 Oct 65	3	0	56	
hai Nguyen Bay Br	18.32	20-21-40N/105-55-40E	14 July 65	1	0	26	
ho Mai Bay Br	18.33	21-35-51N/105-50-24E	28 Sept 66	60	0	48	
a Gia Bay Br	18.35	21-52-55N/105-46-26E	20 Oct 65	0	0	15	
au Xung Bay Ferry	18.36	21-19-40N/105-52-28E	21 July 66	5	0	28	
an Yen Lot Bay Br S	18.40	17-24-00N/106-38-50E	10 May 66	0	0	22	
auc Thien Bay Br	18.41	21-16-42N/103-00-27E	2 Aug 66	0	0	43	
	18.44	18-57-51N/105-34-20E	23 Sept 65	0	0	70	

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES CIV.	ESTIMATED CASUALTIES MIL.	No. OF COPIES	REMARKS
Xen Ghat Na Hwy Dr	18.46	18-40-37N/105-36-32E	25 Apr 65	0	0	36	
La Phan Hwy Dr	18.47	19-00-24N/105-35-33E	22 Apr 66	1	0	14	
Sa Dinh Hwy Dr	18.49	18-24-03N/105-43-41E	23 Apr 65	1	0	25	
Dien Chau RR Dr	18.5	18-58-20N/105-34-55E	25 Sept 66	3	0	63	
Phoi Hoi Hwy Dr	18.51	18-21-37N/105-37-00E	16 Apr 66	3	0	16	
Xoc Gia Hwy Dr	18.52	18-25-01N/105-48-30E	13 Nov 66	1	0	59	
Tha Son Hwy Dr	18.53	18-27-22N/105-46-43E	29 Apr 66	1	0	27	
Tha Vinh Hwy Dr	18.54	18-19-02N/105-54-59E	6 May 66	14	0	38	
Phoi Hwy Dr	18.55	17-52-30N/106-26-45E	6 Mar 66	1	0	41	
La Phan Hwy Dr	18.58	21-39-25N/106-35-22E	16 Nov 65	0	0	150	Strike data incomplete.
Phoi Da RR & Hwy Dr	18.6	18-50-53N/105-39-19E	2 Oct 66	1	0	38	
Phoi Can Hwy Dr	18.61	22-09-09N/105-50-38E	20 Dec 65	6	0	16	
La Phan Hwy Dr	18.62	21-44-50N/106-01-15E	16 Nov 65	0	0	11	
Vinh Hwy Dr	18.63	22-16-08N/104-53-40E	28 Sept 66	1	0	20	
Phoi Hoi Hwy Dr	18.64	21-48-10N/103-18-28E	29 July 65	0	0	63	
Phoi Hwy Dr	18.66	21-01-19N/106-32-19E	1 July 66	1	0	37	
Phoi Hwy Dr	18.69	18-03-51N/105-49-20E	10 June 66	2	0	111	
Phoi Hwy Dr	18.7	19-15-45N/105-41-20E	11 Oct 66	0	0		

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES CIV.	ESTIMATED CASUALTIES MIL.	NO. OF HOSTILES	REMARKS
at Chuoi RR Jc S	18.74	21-26-35N/106-21-28E	31 Oct 65	5	0	22	
Long Nhat Hwy Rr	18.75	21-30-23N/106-21-08E	1 Oct 66	20	0	18	
Chanh Hwy Rr	18.76	21-07-24N/107-21-05E	28 Nov 65	0	0	16	
Chanh Hwy Rr N	18.77	21-07-30N/107-21-09E	21 Apr 66	0	0	6	
Long Phong Thuong RR & Hwy Rr	18.8	19-58-39N/105-50-50E	27 Nov 66	8	0	148	
Ca Trang Hwy Rr	18.9	17-57-30N/105-48-55E	9 Nov 66	1	0	64	
Long Phong Thuong RR & Hwy Rr	19.0	21-04-58N/105-55-10E	18 Dec 66	15	0	58	See Note 1
Hoi An Car Repair Shops Gia Lam	20	21-02-59N/105-53-05E	18 Dec 66	5	0	N/A	Struck during attacks on JCS #19.
Long Phong Thuong RR	21.1	18-41-18N/105-40-05E	1 Dec 66	25	0	51	
Long Phong Thuong RR Sta Yds & Shops	21.11	21-33-41N/105-51-03E	1 Aug 66	6	0	23	
Long Phong Thuong RR Sta Yds & Shops	24	17-31-08N/106-34-52E	11 Feb 65	0	32	72	
Long Phong Thuong RR Sta Yds & Shops	25	21-19-50N/103-54-32E	14 Mar 66	3	36	174	
Long Phong Thuong RR Sta Yds & Shops	26	21-22-46N/103-01-19E	7 Mar 66	14	126	239	
Long Phong Thuong RR Sta Yds & Shops	28	20-49-26N/104-43-52E	11 Nov 65	7	70	96	
Long Phong Thuong RR Sta Yds & Shops	29	20-10-40N/105-54-35E	4 May 66	3	45	51	
Long Phong Thuong RR Sta Yds & Shops	32	16-54-15N/106-49-50E	23 May 65	0	21	64	
Long Phong Thuong RR Sta Yds & Shops	33	17-28-20N/106-35-40E	7 Oct 65	3	29	59	

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Additional sorties probable. Target
 anticipated during ground.
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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CIV.	ESTIMATED CASUALTIES HEL.	NO. OF COPIES	REMARKS
Vietnam Air Army Bks & Storage	36	17-01-10N/106-38-10E	31 May 65	0	1	12	
Ho Chi Minh Army Bks	37	20-19-39N/104-33-11E	24 Sept 65	0	18	45	
Army Bks Central NE	38	18-10-22N/105-41-15E	18 Sept 65	6	25	143	
Chang Le Army Bks NW	39	17-07-50N/106-56-50E	10 June 65	2	14	86	
Bien Quang Army Bks SW	39.1	17-01-00N/106-55-10E	2 Sept 66	0	41	82	
Hanoi Air Army Bks S	39.11	17-34-09N/106-31-20E	8 Nov 65	3	20	64	
Donkhai Air Bks Citadel	39.12	17-27-59N/106-37-34E	9 Aug 65	22	50	40	
Phu Tho Air Bks & Supply Depot	39.13	17-36-50N/106-27-30E	24 Sept 65	1	25	24	
Ba Son Air Bks	39.14	17-45-13N/106-26-25E	2 Sept 66	21	30	32	
Hoa Thuan Air Army Bks	39.15	17-10-30N/106-49-20E	29 June 65	1	6	12	
Honai Air Bks 115 Ile Dutigne	39.16	17-09-34N/107-20-05E	22 Apr 66	0	*	44	
Donkhai Air Bks Camp	39.17	17-45-26N/105-46-26E	27 Oct 65	0	*	4	
Phu Tho Air Military Installation	39.18	19-22-55N/104-11-10E	2 Feb 66	0	*	7	
Honai Air Station	39.19	19-22-55N/104-11-45E	12 June 65	3	1	7	
Vinh Air Army Bks Central NE	39.2	17-03-58N/107-01-00E	22 Mar 66	6	13	100	
Ten Binh Air Bks NW	39.21	19-15-20N/105-46-35E	28 Sept 65	0	*	93	
Thanh Hoa Air Bks S	39.22	19-46-20N/105-46-31E	24 Aug 65	2	*	52	

Dropped from JCS tgt list and combined with JCS #72

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NAME	JCS NO.	COORDINATES	DATE OF DDA PHOTO	ESTIMATED CIV.	ESTIMATED CASUALTIES MIL.	NO. OF COPIES	REMARKS
Thon Son Army Bks SSE	39.23	19-45-30N/105-51-00E	16 June 65	3	*	15	
Son Son Army Bks W	39.24	19-44-48N/105-52-15E	5 June 66	1	12	14	
Vinh Son Army Bks S	39.25	18-52-37N/105-19-07E	19 July 65	2	*	34	
Dong Cao Thon Army Bks	39.26	17-50-28N/106-05-10E	11 Sept 65	0	*	20	
Vinh Army Bks HNE	39.27	18-43-56N/105-41-27E	29 Apr 66	2	18	28	
Bach Tuong Army Bks NE	39.28	19-54-35N/105-27-42E	30 Nov 65	2	*	66	
Maeda River Army Supply & Staging Point	39.3	17-40-45N/105-46-12E	9 Feb 66	0	*	53	
Xoai Truong Army Bks & Ammo Depot HNM	39.31	18-43-22N/105-29-46E	29 Aug 65	0	*	40	
Xoai Bang Army Bks E	39.32	17-06-58N/106-49-15E	13 Sept 65	1	*	15	
Hachinh Army Bks & Supply Depot	39.34	18-19-55N/105-54-41E	20 June 66	15	28	73	
Cong Binh Army Bks HNM	39.35	19-45-58N/105-35-09E	30 Nov 65	0	*	121	
Vinh Army Bks HNM	39.36	18-40-57N/105-39-50E	2 May 66	1	5	45	
Phu Van Army Bks SSE	39.39	18-49-00N/105-18-27E	29 Oct 65	1	10	55	
Quang Binh Army Bks	39.40	18-55-50N/105-26-10E	26 May 65	1	*	8	
Giap Phong Army Bks	39.47	18-49-15N/105-12-00E	12 Dec 65	0	*	7	
Quang Tri Army Bks	39.49	17-41-56N/106-29-24E	24 Nov 65	0	*	7	
Xoai Truong Army Bks & Supply	39.5	18-42-40N/105-28-36E	8 May 65	1	*	7	

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CIV.	ESTIMATED MIL.	NO. OF COPIES	REMARKS
Vinh Binh Army Bks SM	39.6	17-03-00N/106-58-46E	10 Sept 65	0	*	27	
Vinh Binh Army Bks F Lien Cong	39.7	17-03-16N/107-02-40E	22 Aug 65	4	*	42	
Vinh Binh Army Bks HN Xom Cho	39.8	17-04-10N/107-00-40E	28 Sept 65	5	*	40	
Xom Y Lamh Army Bks	39.9	17-48-03N/105-46-57E	17 June 65	0	*	12	
Quil Armo Depot SM	40	19-17-31N/105-22-48E	4 June 65	0	*	156	
Phu Van Armo Depot E	41	18-49-00N/105-18-44E	16 July 65	0	0	104	
Phu Van Armo Storage	42	18-50-00N/105-19-40E	6 May 65	7	*	10	
Quil Armo Depot W	43	20-00-00N/105-14-32E	6 July 65	0	*	117	
Yen Can Depot	44	21-42-32N/104-52-50E	23 May 66	2	92	54	
Phu Van Armo Depot	46	21-23-50N/103-56-20E	14 July 65	0	*	26	
Yen Can & Armo Depot	47	21-35-53N/104-59-22E	26 Sept 65	0	*	81	
Yen Can Armo Bks & Armo Storage	47.1	21-10-05N/105-22-59E	16 Sept 65	0	*	112	
Hoai An Armo Depot	47.11	20-25-57N/105-32-45E	14 July 65	0	*	128	
Laos Hoi Armo Depot	47.12	21-32-07N/106-14-10E	15 Oct 65	0	*	19	
Yen Xom Armo Depot SE	47.13	21-43-19N/105-08-00E	26 Sept 65	0	*	131	
Xom Rang Armo Depot	47.18	17-44-50N/105-56-10E	10 Feb 66	0	*	49	
Yen Can Armo Depot	47.19	21-18-22N/104-41-50E	18 Sept 65	3	*	99	

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NAME	JCS NO.	COORDINATES	DATE OF IDA PHOTO	ESTIMATED C/QUALITIES		NO. OF COPIES	REMARKS
				CIV.	MIL.		
Lam Chi Explosives Plant	47.2	21-41-38N/105-15-00E	6 Nov 65	2	1	28	
Phu Phan Ammo Depot	47.22	22-06-50N/105-53-10E	15 Sept 65	0	*	118	
Bat Phong Pet Prod Storage	48	20-52-17N/106-39-44E	12 July 66	4	1	52	
Phu Loi Pet Prod Stor Thanh An	49	21-03-56N/105-53-51E	2 July 66	8	1	24	
Vinh Pet Prod Storage	50	18-40-15N/105-43-19E	9 Nov 66	7	0	37	
Nguyen Khe Pet Prod Storage	51	21-10-11N/105-51-34E	9 Oct 66	3	7	54	
Phu Loi Pet Prod Stor GSN HQ	51.1	21-15-57N/105-50-17E	5 Oct 66	8	*	58	
Bao Giang Pet Prod Storage	51.11	21-15-57N/106-12-01E	4 Oct 66	1	0	29	
Phu Dinh Pet Prod Storage	51.12	20-24-43N/106-10-39E	12 Oct 66	4	0	29	
Do Son FOL Storage	51.13	20-42-26N/106-47-53E	26 Aug 66	3	0	58	
Viet Tri Pet Prod Storage	51.14	21-17-45N/105-26-10E	21 Sept 66	1	0	31	
Phu Loi Pet Prod Storage	51.16	19-12-57N/105-21-11E	22 Sept 66	40	2	38	
Duong Lam Pet Prods Str UG	51.17	21-01-42N/106-30-52E	15 Sept 66	0	0	61	
Canhien Pet Prod Stor PUG	51.18	21-23-35N/106-18-39E	2 Dec 66	0	0	28	
Vinh HQ HQ 113 117, Army Dks & Supply Depot	52	18-39-50N/105-41-56E	2 May 66	16	*	163	Includes JCS #38. After Sept 1965
Phu Van Pet Prod Stor SE Da Nang	53	18-47-09N/105-20-16E	27 May 65	6	*	57	
Eden Linn Supply Depot S	54	19-43-00N/105-42-50E	27 Sept 66	5	*	54	
Vinh Son Supply Depot SW Da Nang	55	18-53-40N/105-17-44E	25 Apr 66	1	3		

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES CIV.	ESTIMATED CASUALTIES MIL.	NO. OF SOWERS	REMARKS
Chu Qui Army Hqs & Sup Depo	56	19-19-11N/105-25-18E	16 Nov 65	6	60	50	
Chu Chang Army Hqs S	61	20-17-01N/105-20-20E	30 Sept 65	1	*	16	
Chu Chau Els & Depot	63	21-26-17N/103-41-39E	16 Aug 65	8	*	51	
Chu Loc Storage Area S	63.1	19-17-37N/105-43-36E	20 Aug 65	0	*	5	
Chu Dien Vehicle Depot Complex	63.11	20-57-07N/105-50-58E	18 Dec 66	25	*	61	See Note 1
Chu Duc Warehouse Area	63.12	19-06-10N/105-43-05E	27 Aug 65	4	*	4	
Chu A Army Hqs & Supply Area	63.13	18-01-02N/105-41-35E	9 Oct 65	1	*	5	
Chu Thanh Warehouse Area S	63.2	17-28-59N/105-30-30E	5 Aug 65	1	*	35	
Chu Thanh Warehouse Area W	63.21	17-30-01N/105-29-45E	27 Nov 65	0	*	15	
Chu Bang /rmo Depot	64	17-06-59N/106-45-10E	31 May 66	0	*	54	
Chu 101 Support Facility	65.8	20-14-58N/105-39-10E	28 Nov 65	0	*	52	
Chu 101 Non Radar	67.1	18-07-00N/106-25-25E	31 Mar 65	0	*	26	
Chu Tinh Radar Site	67.11	18-19-20N/105-55-05E	31 Mar 65	0	*	27	
Chu Kott Island Radar Site	67.12	18-17-12N/105-57-53E	10 May 66	0	*	100	
Chu Son Radar Site	67.2	17-57-27N/106-30-25E	28 Aug 66	0	*	75	
Chu 101 Military Radio Comm Station	67.3	17-31-50N/106-34-10E	19 May 65	0	*	6	
Chu 101 /rmo Site	67.4	17-30-00N/106-36-00E	24 Mar 65	0	*	8	

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PAGE III - Continued

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NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES		NO. OF SIGHTS	REMARKS
				CIV.	MIL.		
Vinh Linh Radar Site	67.5	17-05-00N/107-07-00E	5 Apr 65	0	*	29	
Lo Radar Site	67.7	18-50-00N/105-40-50E	9 June 66	0	*	51	
N Duc Radar Site	67.8	19-53-01N/105-57-01E	4 Oct 66	0	*	10	
Hue Island Radar Site	67.9	18-48-00N/105-47-10E	2 Nov 65	0	*	34	
Con Hoa Port Facilities	68	21-01-09N/107-22-14E	21 June 66	20	0	18	
Hue Gia/Red Chey Port & Naval Complex	69	20-57-12N/107-04-00E	2 Nov 66	14	1	56	
Lo Radar Site	71	18-33-50N/105-42-30E	9 Nov 66	0	0	10	
Lo Radar Site	71.1	18-43-31N/105-44-39E	5 June 66	10	14	80	
Lo Radar Site	71.13	19-50-03N/105-47-55E	18 July 65	*	0	40	
Lo Radar Site	71.14	19-54-23N/105-31-45E	24 Aug 65	*	0	33	
Lo Radar Site	71.19	19-54-23N/105-31-45E	24 Aug 65	*	0	33	
Lo Radar Site	74.1	17-42-22N/106-28-56E	1 May 66	2	*	61	
Lo Radar Site	76	21-33-42N/105-52-08E	6 July 66	1	0	N/A	Struck during attack on JCS #21.11
Lo Radar Site	82	21-02-15N/106-47-27E	4 Sept 66	43	0	82	
Lo Radar Site	82.1	19-50-03N/105-47-26E	23 Sept 66	4	*	53	
Lo Radar Site	82.11	18-38-19N/105-42-20E	9 Nov 66	24	0	21	
Lo Radar Site	82.15	20-25-17N/106-10-34E	6 Aug 65	17	0	31	
Lo Radar Site	82.16	21-36-37N/105-49-07E	8 July 66	20	0		

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Specific data incomplete.

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PART III - Continued

NAME	JCS NO.	COORDINATES	DATE OF BDA PHOTO	ESTIMATED CASUALTIES		NO. OF SORTIES	REMARKS
				CIV.	MIL.		
Viet Tri Thermal Power Plant	82.17	21-17-57N/105-25-26E	19 July 66	1	0		Strike data incomplete.
Co Dinh Thermal Power Plant	82.18	19-44-05N/105-37-38E	6 Nov 66	10	0	29	
Pan Thach Hydroelectric Power Plant	82.21	19-54-25N/105-31-50E	24 Aug. 65	*	0	33	
TOTALS				736	931	8516	
<p>*Indicates that analysis is in progress to determine estimated casualties.</p> <p>Note 1: Estimates of casualties resulting from strikes on JCS #19 and JCS #63.11 do not include casualties which occurred at the time of those strikes within the city limits of Ha Noi. Approximately 175 structures were damaged or destroyed in Ha Noi, 163 due to a fire of unknown origin in the vicinity of Phu Tan Street where the North Vietnamese reported 4 dead and 10 injured.</p>							
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PAGE IV

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ESTIMATES OF CASUALTIES FOR NON-JCS TARGETS (U)

Date:

NAME	P.E. NO.	COORDINATES	DATE OF BDA PHOTO	CIVILIAN STRUCTURE DEST/DAM	ESTIMATED CIV. CASUALTIES	CASUALTIES MIL.	NO. OF SOURCES	REMARKS
R Don Bets FOL Storage	0617-01024	17-45-08N/106-26-12E	2 Sept 66	48	12		149	
R Lot Army Bets	0616-00124	21-11-51N/104-06-21E	23 Dec 65	58	15		64	
R Lot Army Bets/Supply Depot	0616-00274	21-12-35N/104-03-10E	11 Nov 65	5	1		4	
Camp Le Army Bets SSE	0617-0078	17-05-49N/106-58-30E	9 May 65	12	3		36	
R Tnuy RR Bridge	0617-00786	19-22-00N/105-43-05E	21 Sept 66	25	6		40	
D-3 Quan FOL E	0616-01748	21-26-14N/106-12-25E	4 Sept 66	63	1		36	
D-3 Quan FOL W	0616-01749	21-25-30N/106-11-55E	4 Sept 66	19			28	
D-5 Giap FOL	Unassigned	18-24-32N/105-53-05E	8 Aug 66	3	1		9	
D-5 Thon IR Siding	0616-02904	20-19-47N/106-04-58E	17 Sept 66	66	17		22	
D-5 Thon Storage Area	0617-01321	18-32-30N/105-35-30E	18 Aug 66	65	16		41	
Hanoi S/M Site C-30-2	0616-00983	21-13-00N/105-21-45E	29 July 65	12	3		10	
Hanoi S/M Site D-36A-2	0616-02397	21-35-09N/105-50-06E	25 July 66	5	1			See Note 1
Hanoi S/M Site D-36A-2	0616-00962	20-12-30N/105-58-10E	29 Sept 66	8	2		19	
Hanoi S/M Site D-36A-2	0617-00410	19-23-19N/105-45-09E	15 Sept 66	3	1		18	
Hanoi S/M Site D-36A-2	0617-00481	18-53-47N/105-36-15E	22 May 66	2	1		11	
Hanoi S/M Site D-36A-2	0616-02347	20-26-50N/106-13-14E	26 Aug 66	1	3		10	

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NAME	B.E. NO.	COORDINATES	DATE OF BDA PHOTO	CIVILIAN STRUCTURE DESTROYED	ESTIMATED CIV. CASUALTIES	NO. OF SIGHTS	REMARKS
Binh Tranchshipment Facility	0616-00483	20-25-11N/106-11-11E	12 Oct 66	33	8	25	
Phia Lo Airfield	0616-00417	21-35-57N/104-30-21E	12 Jan 66	113	28	37	
Lat Tan AAA Site	Unassigned	21-04-40N/105-49-30E	17 Aug 66	19	5		
Binh Binh Ets/Storage Area	Unassigned	20-15-11N/105-58-11E	31 Dec 66	316	79	73	See Note 1
Binh Binh Post Repair Yard	0616-01030	20-15-25N/105-59-30E	31 Dec 66	19	5	6	
Binh Binh Military Hqs	0616-02303	20-15-11N/105-58-11E	31 Dec 66	18	5	4	
Binh Binh Bridge Bypass	0616-02230	20-15-05N/105-55-10E	31 Dec 66	12	3	14	
Binh Binh RR Yard	0616-00978	20-15-16N/105-58-10E	31 Dec 66	20	5	35	
Binh Binh Transportation Facility	0616-00578	20-05-20N/105-05-31E	6 Oct 66	123	31	25	
Ca Ta Port Facility	0615-00185	20-43-18N/107-03-13E	29 Sept 66	30	8	60	
Hop RR Bridge	0616-00894	21-49-09N/104-45-39E	8 Oct 66	13	3	26	
Binh Tranchshipment Area W	0616-01137	20-32-25N/105-55-00E	21 Oct 66	58	15	24	
Binh Tranchshipment Facility	0616-00830	20-31-30N/105-55-10E	21 Oct 66	37	9	48	
Ly RR Yard	0616-01662	20-32-37N/105-55-10E	21 Oct 66	72	18	52	
Phu Tho RR Yard	0616-01829	21-24-05N/105-13-35E	4 July 66	5	1	9	
Phu Van RR Yard	0617-00089	18-50-48N/105-18-10E	19 Mar 65	19	5		

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See Note 1

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NAME	B.R. NO.	COORDINATES	Date OF BDA PHOTO	CIVILIAN STRUCTURE DEST/DAM	ESTIMATED CASUALTIES CIV.	ESTIMATED CASUALTIES MIL.	NO. OF BODIES	REMARKS
Phu Loi PLE	0617-00880	18-43-25N/105-44-45E	9 Oct 66	28	7		22	
Cong Tho Port Facility	Unassigned	17-42-11N/106-29-11E	1 May 66	21	5			See Note 1
Cong Vinh RR Siding	0617-02047	19-15-59N/105-41-48E	14 June 66	25	6		56	
Soi Cop Storage Area	0616-00021	20-53-36N/103-37-08E	25 Apr 66	9	2		4	
Trinh Hoa Army Bks	0617-09301	19-48-51N/105-47-41E	22 Sept 66	38	10			See Note 1
Trinh Hoa Army Dist/Supply Depot	0617-00010	19-48-32N/105-46-19E	22 Sept 66	55	14			See Note 1
Trinh Hoa RR Yard	0617-00709	19-48-29N/105-46-15E	14 Aug 66	130	33		43	
Trinh Hoa Base Area	0617-00378	19-48-19N/105-47-35E	22 Sept 66	16	4			See Note 1
Trinh Hoa RR	0617-002309	21-38-15N/105-48-25E	20 July 66	9	2		12	
Trinh Hoa RR	0617-00797	19-31-50N/105-42-50E	9 Oct 66	33	8		40	
Trinh Hoa RR end bypass	0617-01317	19-40-05N/105-42-26E	20 Sept 66	8	2		69	
Trinh Hoa RR Bridge	0617-03534	19-46-56N/105-32-55E	4 Sept 66	1	0		18	
Trinh Hoa RR	0617-01428	19-09-20N/105-37-50E	24 July 66	4	1		39	
Trinh Hoa RR Yard/Bridge	Unassigned	19-46-25N/105-48-37E	5 Oct 66	18	5		40	
Trinh Hoa RR	0617-00182	16-40-20N/105-40-53E	11 June 66	29	7		9	
Trinh Hoa RR	0617-01331	19-02-59N/104-52-48E	16 June 66	90	23		48	
Trinh Hoa RR	0617-01070	18-42-29N/105-27-00E	18 Sept 66	4	1		4	

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NAME	R.E. NO.	COORDINATES	DATE OF BDA PHOTO	CIVILIAN STRUCTURES DESTROYED/DAM	ESTIMATED CASUALTIES CIV.	ESTIMATED CASUALTIES MIL.	NO. OF SOKELERS	REMARKS
See Note 10L	0617-04035	17-53-42N/105-49-49E	14 Oct 66	2	1		71	
Yes: Bldg/Storage Area	0616-00315	21-41-58N/104-53-06E	5 Dec 66	300	75			See Note 1
Yes: Bldg Storage Area	0617-00318	21-41-30N/104-51-45E	5 Dec 66	280	70			See Note 1
Yes: Bldg Support/Admin Area	0616-00317	21-41-50N/104-52-30E	5 Dec 66	160	40			See Note 1
Yes: Bldg RR Yard	0616-00335	21-42-15N/104-53-04E	5 Dec 66	60	15			See Note 1
Yes: Bldg RR	0617-05005	19-38-52N/105-35-52E	12 Oct 66	3	1		105	
Yes: Bldg RR	0617-05005	19-38-52N/105-35-52E	12 Oct 66	2817	708		1527	

Note 1: Satellite data incomplete.

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1. (SNF) The following are total estimated casualties derived from the tabulations in Parts III and IV:

	<u>Warned Population</u>	<u>Unwarned Population</u>
JCS Numbered Targets (175):		
Civilian:	736	7,360
Military:	<u>931</u>	<u>9,310</u>
Total:	1,667	16,670
Non-JCS Numbered Targets (11):		
Civilian Only:	708	7,080
Total Civilian:	1,444	14,440
Total Military and Civilian:	<u>2,375</u>	<u>23,750</u>

2. (SNF) The following are estimates of total civilian casualties in five city complexes. Note these casualties are included in Parts III and IV associated with specific targets.

<u>Complex</u>	<u>Coordinates</u>	<u>Date of RDA</u>	<u>Warned</u>	<u>Unwarned</u>
Nam Dinh	20-25-17N/106-10-34E	12 Oct 66	78	780
Ninh Binh	20-15-20N/105-59-10E	31 Dec 66	101	1010
Phu Ly	20-32-30N/105-55-12E	21 Oct 66	47	470
Thanh Hoa	20-49-40N/105-47-20E	22 Sept 66	95	950
Yen Bai	21-41-33N/104-52-50E	5 Dec 66	202	2020

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